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ABSTRACT

The impact of Malaspina College, British Columbia, on the local economy was investigated to update a 1977 study. The variables used to assess the college's impact were: (1) income injected into the local economy as a result of expenditures of the colleges, its employees, and its students; (2) college-related revenues received by local governments, (3) costs incurred by local businesses and governments due to the existence of the college; and (4) the number of local jobs attributable to the presence of the college. A model was used to estimate the magnitude of the short-run impact of the college over a given time period (the fiscal year 1982-1983). In addition to estimating income and expenditure multipliers for the local economy, an employment multiplier was estimated to project the number of local jobs resulting from the presence of the college. It was estimated that the total direct and indirect impact of the expenditures by the school, its students, and employees was over 15 million dollars for 1982-1983. These expenditures provided support for an estimated 960 jobs. Appendices include: student and employee questionnaires, statistical findings, and information on calculating the income multiplier and the employment multiplier. (SW)

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THE IMPACT OF MALASPINA COLLEGE ON THE LOCAL ECONOMY

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October, 1983

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Preface

The research reported in this paper was undertaken primarily to bring up-to-date the findings of the 1977 study completed by the author entitled The Economic Impact of Malaspina College On The Local Economy. For this reason the methodology used in the current research parallels that used in 1977. There are some differences between the two studies however. Some of these differences make the current work more comprehensive and accurate while others detract from the quality that existed in the 1977 study.

Improvements have occurred primarily because more detailed information was collected on student spending habits and also because a small number of computational errors that appeared in the 1977 study have been corrected. In addition, the indirect impact of the College-related expenditures has been more accurately estimated due to more precise calculations of income multipliers.

Deficiencies in the current study arise from the lack of up-to-date, detailed statistical information on the local economy. Because of the lack of statistical information the value of local business real property committed to the College was not calculated this time. In a couple of other instances key economic relationships that were calculated from 1971 census data were assumed to hold for the current year.

Research of the nature reported herein requires the assistance of a great many people and organizations. The greatest debt of gratitude is owed to those who provided the data for this study. I wish to thank the employees and students of Malaspina College, the Bursar's Office, the City of Nanaimo, the Regional District of Nanaimo, the Town of Ladysmith, the British Columbia Assessment Authority, School District 68 and Statistics Canada for their assistance.

For patiently labouring through the tedious process of typing this paper, I would like to express my appreciation to Celia Driscoll and Ruth Harrison.

I owe a very special debt of gratitude to my wife Marti who collected most of the data, made many of the calculations and proof read various copies of the paper.

INTRODUCTION

An impact study of this nature presents three initial problems: (1) the development of a suitable definition of the local economy, (2) the designation of a number of variables that will adequately assess the economic impact of the College, and (3) the creation of a model, or system of equations, that organizes the preceding variables so as to provide a reasonable estimate of the magnitude of the impact.[1]

Initially the College Region appeared to be the most logical definition of the local economy. This definition was rejected, however, because the College-related expenditures, which constitute a major portion of the impact, do not have any meaningful influence on an economy as geographically large as the College Region. On the other hand, the City of Nanaimo was deemed to be too small an area because, quite obviously, the impact of the College goes beyond the city limits. For these reasons, and because the geographical boundaries of the Census Agglomeration for Nanaimo approximates that of School District 68, thereby simplifying the collection of data, School District 68 was selected to represent the local economy.

The variables used to assess the impact of Malaspina College represents: (1) income injected into the local economy as a result of the expenditures of the College, its employees and its students, (2) College-related revenues received by local governments, (3) costs incurred by local businesses and governments due to the existence of the College and (4) the number of local jobs attributable to the presence of the College.

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[1] The model used in this study was adopted from: John Caffrey and Herbert H. Isaacs, Estimating The Impact of a College or University on the Local Economy (Washington, D.C.: American Council on Education, 1971).

Because College-related expenditures have a much larger impact than is indicated by the initial round of transactions, income and expenditure multipliers were estimated for the local economy. In addition, an employment multiplier was also estimated thereby allowing for a more accurate projection of the number of local jobs resulting from the presence of the College.

The model used in the study is composed of approximately thirty-five equations and required some eighty pieces of data. It is based on simple linear cash-flow formulas that take into account only those variables that were easily quantifiable. The model is designed to estimate the magnitude of the short-run impact of Malaspina College on the local economy over a given period of time, in this case the 1982-83 fiscal year of the College. It is not designed to resolve policy questions of a predictive nature such as whether the College should expand its services, nor does it measure the qualitative impact of these services.

There are a number of other limitations of the model which should be stated at the outset: (1) because the model attempts to measure only the economic impact, considerations regarding the cultural, social and educational benefits of the College have been disregarded, (2) although there may be great temptation to convert the results of this study into a cost-benefit measure of the College's economic impact, this is not theoretically possible because the logic of the model is not the same as that used in cost-benefit analysis, and (3) some specific impacts, such as the expansion of the local credit base resulting from College-related deposits, have been omitted. This is primarily because of the inability to acquire reliable data. Given these limitations, the results of this study underestimate the economic impact of Malaspina College and omit other factors that bear on the total impact of the College on the local environment.

THE DIRECT ECONOMIC IMPACT

The Impact On Local Business

The direct local expenditures of the College, its personnel, and students for the 1982-1983 fiscal year were estimated to be $1,241,120, $3,356,090 and $6,545,596 respectively, for a total initial impact on the business sector of the local economy of $11,142,806.

Non-Salary College Expenditures

Malaspina College's non-salary operating expenditures of $1,241,120 were determined by subtracting from the College's 1982-83 total operating funds expenditures the salaries and fringe benefits of College employees, expenditures that were known to be non-local such as travel, capital debt payment, book purchases etc., and payments to governments (utilities, water and sewer etc.).[2] The difference was then multiplied by 0.447 or the proportion of non-salary operating expenditures made in the local economy. This proportion, which is a ratio of the value of purchases made from local firms to the value of total purchases, was based on purchase order information for the period of September 1982 to February 1983.

By exempting employee fringe benefits and those expenditures classified as "known to be non-local", the impact is underestimated because a portion of those expenditures may have benefited someone in the local community.

Expenditures by College Employees

College employees were divided into two groups, those who lived within the local economy (School District 68) and those who did not, and were considered to make only housing and non-housing expenditures. The total local expenditures by College employees were approximated by adding together

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[2] Actual expenses by Object of Expense for Malaspina College: 1982/83 Year End.

non-housing expenditures of local and non-local faculty and the rental housing expenditures of local employees.[3]

The information for the preceding calculations was gathered by surveying the 325 full-time College employees (Appendix A). Two-hundred and ninety questionnaires were distributed; 115 or 39.6 percent were returned. Of those returned, ten questionnaires were spoiled.

The findings of the survey revealed that approximately 90 percent of the full-time employees lived within the local economy, they spent 65 percent of their total expenditures on non-housing goods and services while approximately 68 percent of these expenditures were made locally. In total, $3,356,090 was spent in the local economy last year by College employees. Of this amount, local employees spent $592,110 for rental housing and $2,659,679 for non-housing items while non-local employees made non-housing expenditures of $104,301.

A priori, it appears that these calculations understate the magnitude, and thus the impact, of the local expenditures of College employees. Underestimation results from the omission of expenditures associated with owner occupied dwellings such as real estate broker's fees, interest charges on mortgages and housing insurance premiums.[4] In addition, imputed rent for houses owned outright by College employees was not accounted for, nor was non-College related income.[5]

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[3]The impact of local non-rental housing expenditures is accounted for in a later equation that includes an estimate of real estate taxes paid to local governments.

[4]Because it is difficult to determine the proportion of these expenditures that benefit the local community, they were omitted entirely to preserve the conservative nature of the model.

[5]Imputed rent is income that is foregone because the house if not offered on the rental market.

Although no consideration was given to either non-housing borrowing or saving, it is highly unlikely that the difference between the two is sufficiently large enough to warrant consideration.

Finally, there are two other omissions that should be recognized although they appear to be relatively insignificant. First, overestimation of the local rental income is possible depending upon the proportion exported from the local economy by non-resident owners. Second, regardless of the different income levels of College employees, they were assumed to have spent the same proportion of their income in the local economy. Although it is a well known fact in economics that the propensity to import becomes larger the higher the income, it is doubtful that the difference in salaries among College employees is large enough to produce significantly different propensities to buy goods and services from outside the local economy.

Expenditures by College Students

Information regarding the local expenditures by students was gathered by surveying approximately 20 percent of the full-time students in each of four different groups (Appendix B). Students were categorized as vocational, university-transfer, career-technical or adult basic education students on the basis of course or program registration as of January, 1983. The vocational survey was structured so as to include responses from students in a wide cross-section of vocational programs, while the university-transfer and career-technical students were chosen at random from computerized student records. Two classes of adult basic education students were surveyed.[6]

In total, the local expenditures of students for 1982-

[6]The number of students surveyed was: university-transfer - 98, career-technical - 100, adult basic education - 35, vocational - 138. The average full-time enrollment on a semester basis was determined to be 550, 480, 850 and 155 respectively.

83 amounted to $6,545,596 thus providing the largest single direct impact on local businesses. Of this amount, $2,207,497 was spent on rent, $3,114,041 was spent on non-housing items by renters and $1,224,058 on non-housing items by non-renters, that is, those students paying room and board or living at home.

Table 1 provides more detailed information regarding the monthly expenditures of students.

TABLE 1

Average Monthly Expenditures Per Student

Program	Housing		Non-Housing			
			Renters		Non-Renters	
	% of Students Paying Rent	Average Monthly Rent	Average Monthly Amount	% Spent Locally	Average Monthly Amount	% Spent Locally
University Transfer	34	$195	$296	94	$120	86
Vocational	56	223	302	84	204	69
Career-Technical	39	242	363	94	149	81
Adult Basic Education	67	279	476	87	224	76

Source: Student Survey

[7] Vocational student expenditures were tabulated on the basis of a twelve month year, university transfer and career-technical expenditures were based on eight months, while adult basic education expenditures were based on eleven months.

From the information provided in Table 1 some general comments can be made about student average monthly spending. Among the four groups of students: (1) university transfer students spend the least on housing and non-housing purchases while the adult basic education students spend the most, (2) the highest proportion of renters occur among the adult basic education students while the lowest occurs among university transfer students, (3) non-renters spend less on non-housing purchases than do renters, and (4) non-renters also spend a smaller proportion of their non-housing expenditures in the local economy than do renters.

It is possible to explain some of the above observations by focusing on more detailed data regarding student living arrangements (Table 2). The fact that non-renters among the university transfer and career-technical students spend a much larger proportion of their non-housing purchases in the local economy is explained by the fact that, among the non-renters, 91 percent of the university transfer students and 85 percent of the career-technical students live at home. As indicated in Table 2, these figures are much higher than those for the other two groups of students. The relatively low average monthly rent paid by university transfer students is explained in part by the very low proportion (3 percent) of the university transfer students who were counted as paying rent but who, in fact, were making mortgage payments.

Other explanations can be put forth to account for some of the remaining differences in student spending. The fact that renters spend a larger proportion of their non-housing expenditures in the local economy than do non-renters can be explained by the much wider variety of goods purchased by renters, which includes food, and also by the greater likelihood that among the non-renters who pay room and board, there is probably a greater propensity to travel home more often and thus spend less locally. The fact that university transfer students spend less per month than do the other three groups of

students, is most likely explained by the much longer time horizon associated with their educational objectives. It costs more for a university degree than for a college diploma or certificate. Another explanation for the higher average monthly expenditures associated with the vocational, career-technical and adult basic education students is based on the fact that some of these students receive financial help from the federal and provincial government to assist in retraining whereas the university transfer students do not.

TABLE 2

Student Living Arrangements

	Renters		Non-Renters	
	Rent	Mortgage	Room and Board	Live at Home
University Transfer	97% (32)	3% (1)	9% (6)	91% (59)
Vocational	91 (70)	9 (7)	39 (24)	61 (37)
Career-Technical	86 (51)	14 (8)	15 (6)	85 (35)
Adult Basic Education	89 (33)	11 (4)	67 (12)	33 (6)

Source: Student Survey

Because the students of the College produced by far the largest injection of income into the local economy when compared to the College itself or its employees, it is important to point out some of the limitations of the methodology and results. From an aggregate standpoint the $6.5 million in

student expenditures is underestimated because it does not include expenditures for room and board or local expenditures of students who commute daily from outside the local economy. On the other hand, the impact of the rental expenditures may be overestimated depending upon the proportion exported by non-resident owners.

The most obvious limitation is the lack of statistical information regarding the extent to which the sample data is representative of the population. It does appear, however, that the student responses have produced data that is credible.

From the feedback received while the student survey was being conducted, it was very evident that students knew what their housing expenditures were, however, they were less sure of their non-housing expenses and the portion spent locally. As far as the average monthly rent per student is concerned, the results may appear to be high. This conclusion is less likely when one considers that the vast majority of students surveyed live alone or with one other person.

With regards to the proportion of non-housing expenditures spent locally, it is difficult to determine a priori what proportion students would spend in the local community. The only response which appears to be somewhat low is the 69 percent given by vocational students not renting accommodations.

Income of College-Related Enterprises

The College engages in a number of activities which are comparable to, and may tend to compete with, local private business establishments. During the 1982/83 fiscal year Malaspina College realized income of $983,000 from room rentals, liquor sales, the bookstore, food services and the Hairdressing program.

The operation of College-related enterprises that reduce the market potential of local firms respresents a cost to the local economy. This cost is difficult to determine in its entirety, however, it may be approximated by the amount of revenue foregone by local business establishments as a consequence of competition from the College. Consistent with the

conservative nature of the models used in this study, the entire $983,000 is considered to be income foregone by local businesses as a consequence of College-related enterprises.

The Impact on Local Government

College-Related Revenue

The amount of College-related revenue received by local governments during the last year was estimated to be $2,292,375. The sources of this revenue were: (1) real estate taxes paid by local College personnel ($104,548), (2) real estate taxes paid by local business for real property allocable to College-related business ($711,280), (3) provincial grants to public schools allocable to children of College employees and students ($1,405,991) and, (4) revenue, other than real property taxes, received by local governments from the College and its employees ($70,556).

The real estate taxes paid by College employees was determined first by multiplying the average assessed value of residential property in School District 68 ($5,163) by the average residential tax rate (117.126 mills) (Appendix C). The resulting product was then multiplied by the number of College employees who own homes (293 based on survey results).

Real estate taxes paid by local business for real property allocable to College-related business was determined by multiplying the assessed value of the industrial and commercial property in School District 68 ($127,223,553) by the average industrial-commercial tax rate (128.228 mills) (Appendix D). The resulting product was then multiplied by the ratio of College-related local business volume to the total busines volume in the local economy.[8]

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[8]Total business volume is based on 1971 Census Data. Later data is not available and therefore it has been assumed that the 1971 ratio has remained relatively constant.

The amount of the provincial grants to public schools allocable to children of College employees and students was determined by multiplying the total value of the 1982 grants ($29,859,372) by the ratio of children of College employees and students to the total number of students who attended schools in School District 68 (607 ÷ 12,891).[9]

The revenue, other than real property taxes, received by local governments is composed almost entirely of an amount paid by College employees for local government services not covered by property taxes. The nature of these services and the amount paid varies depending upon the location of the residence within the local economy.

The preceding estimates of College-related local government revenues are subject to some obvious limitations. For example, it was assumed that College employees own homes of average value and that all the school-age children of College employees and students attend local public schools. In addition, the amount of real estate taxes paid by full-time students who own their own home was omitted.

College-Related Operating Costs

The annual operating costs of government services provided for the College and/or for individuals related to the College was estimated to be $5,930,305. The major portion of this cost ($4,063,245) was associated with government-provided municipal services. This amount was tabulated by multiplying the 1982 operating costs of local governments ($45,940,047) (Appendix E) by the ratio of the number of persons resident in student and College employee households (3,397 based on survey results) to the 1981 population of the local economy (65,090).

The remaining amount was attributable to the operating budget of local public schools allocable to College-related persons. This amount was estimated to be $1,867,060 and was calculated by multiplying the operating budget for School District 68 ($39,651,215) by the ratio of children of College employees and students atten-

[9] Employee and Student Survey Results and School District 68.

ding local public schools to the total number of children attending public school.[10]

Because the College is labour intensive, the allocation of costs on the basis of population tends to overstate the costs related to the College. In addition, these calculations were based on the assumption that all the operating costs were people-oriented when some might have more appropriately been categorized as property-oriented. This also tends to overstate the costs allocable to the College.

Foregone Real-Estate Taxes

The Malaspina College campus, which encompasses an area of 75 hectares, is exempt from the assessment of real property taxes. This exemption represents foregone tax revenue, that is to say, if the College did not exist local governments would receive some tax revenue that they currently do not receive. This foregone tax revenue is most definitely a cost to local governments.

A problem arises, however, in estimating the magnitude of this cost. In keeping with the tendency to underestimate the impact of the College on the local economy, the value of the foregone tax revenue was determined to be $5,164. This amount was equal to the total real estate tax revenue collected by local governments ($19,234,553) multiplied by the ratio of the geographical area of the College (75 hectares) to the geographical area of the local economy (279,273 hectares).[11] To the extent that the property now occupied by the College was taxed at a residential, industrial or commercial rate, the foregone tax revenue would be much higher.

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[10] School District 68

[11] City of Nanaimo, Annual Budgets, 1983; Town of Ladysmith, Financial Statement, 1982; School District 68 and Malaspina College.

The Impact on Local Employment

Another summary statistic often used to assess the economic impact is the number of jobs supported by College-related expenditures. Of specific interest are the salary and non-salary expenditures of the College and the non-housing expenditures of the students. Insofar as the salary expenditures are concerned, 325 were employed on a full-time basis as of March 31, 1983. This does not include the many people who teach on a part-time basis in the Academic-Technical, Vocational and Community Education Divisions of the College. With respect to the $1,241,120 in non-salary expenditures, it was estimated that 12 jobs were supported directly by these expenditures. This number was arrived at by dividing the non-salary expenditures by the value of wholesale trade per person employed in the wholesale trade sector of the Nanaimo economy.[12] A similar approach was used to estimate the number of jobs directly supported by non-housing student expenditures except retail employment and sales figures were used in place of wholesale figures.[13] This resulted in 116 jobs directly supported by the non-housing expenditures of college students. In total, 453 jobs were estimated to be directly supported by the above mentioned College-related expenditures.[14]

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[12] In 1971 the Nanaimo wholesale trade industry employed 625 people and sold goods and services valued at $62,069,000. Statistics Canada, Wholesale Trade. Catalogue No. 97-723, Ottawa: Queen's Printer, June 1977. Statistics Canada, Catalogue No. 94-743.

[13] Nanaimo retail businesses employed 2,075 people and sold goods and services totalling $77,751,600. Statistics Canada, Retail Trade. Catalogue No. 97-702, Ottawa: Queen's Printer, December, 1976. Statistics Canada, Industries by Sex. Catalogue No. 94-743, Ottawa: Queen's Printer, 1971. Census of Canada.

[14] Because later employment and sales volume figures for wholesale and retail trade have not been produced for Nanaimo, the assumption is that the volume of sales per employee in each case has remained relatively constant since 1971.

THE INDIRECT ECONOMIC IMPACT

The indirect economic impact occurs because of a multiple expansion of the direct expenditures made in the local economy. For every dollar of College-related exditures received by local firms and individuals a certain portion is spent in the local economy while the balance is spent elsewhere. As a result of these local expenditures other firms and individuals receive income and they in turn spend a portion in the local economy. This recycling process, which produces smaller and smaller increments of local income with each successive round of transactions, leads ultimately to a multiple expansion of the initial amount of College-related expenditures and the jobs that are directly supported by these expenditures.

Although it was not the primary purpose of this study to estimate the necessary multipliers from primary data, reasonable estimates were obtained by consulting previous studies, using the raw data collected as a part of this research and relying on data provided by Statistics Canada (Appendices F and G). By using this approach income multipliers of 1.18, 1.31 and 1.42 were calculated for Non-Salary College Expenditures, Expenditures by College Employees and Expenditures by College Students respectively. In addition, an employment multiplier of 2.12 was estimated.

College-Related Expenditures

Wage and salary expenditure data indicated that full-time College employees received a total of $6,685,970 in net pay during the 1982-83 fiscal year. This amounts to disposable income as it is net of all deductions including union dues, federal and provincial income tax withholding, pension conbutions etc. As previously indicated, 90 percent of this total

was paid to employees who live locally and 65 percent of this amount was spent by them on non-housing items. As a consequence $3,911,293 was available to spend locally on non-housing goods and services. When combined with the income multiplier estimated for employee expenditures, a total of $5,133,793 in direct and indirect expenditures resulted from the spending of local College employees. Because of the irability to assess accurately the local impact of employee housing expenditures on the business sector of the economy, the income multiplier was applied to non-housing expenditures only.

With respect to student spending it was estimated that students spent a total of $5,158,736 on non-housing goods and services. Among the four groups of students surveyed, approximately 15 percent of this amount on average was not spent locally. Given this fact, when the student income multiplier of 1.42 is multiplied by the above estimate of student non-housing expenditures, approximately $7,325,405 in direct and indirect expenditures was made by students in the local economy.

Finally, the amount of non-salary operating expenditures made by the College amounted to $2,776,555 in fiscal year 1982-83. (Not all of this amount was spent directly in the local economy; see p. 3). When combined with the multiplier estimated for non-salary expenditures (1.18), the direct and indirect impact of non-salary operating expenditures on the local ecomony amounted to $3,276,335.

Local Employment

A total of 453 jobs was previously estimated to be supported by the direct local expenditures of the College, its employees and students. When combined with the employment multiplier of 2.12 (Appendix G) the total number of jobs supported directly and indirectly by College-related expenditures is 960.

CONCLUSION

The total direct and indirect impact of the expenditures made by Malaspina College, its students and employees was estimated to be $15,725,533 for the 1982/83 period. In addition, it was estimated that these expenditures provided support for a total of 960 jobs. As previously stated, these are conservative estimates and therefore represent an underestimation of the economic impact of the College on the local economy.

The above expenditure and job estimates are not large when compared to aggregate expenditures in the local economy and the size of the local labour force. They do, however, provide ample justification for the conclusion that Malaspina College makes a major contribution to the stength of the local economy while pursuing its objective of meeting the varied educational needs of its students and enhancing the cultural and social environment of the community it serves.

APPENDICES

APPENDIX A

EMPLOYEE QUESTIONNAIRE

1. Do you reside within the boundaries of School District 68? Yes____ No____

2. How many persons are there in your household? ____

3. How many persons in your household attend public school? (Grades K - 12) ____

4. Calculate each of the following as a percent of the monthly take-home pay you receive from the College:

   a) HOUSING EXPENDITURES:

      i) if renting: MONTHLY RENT, or ____%
      if buying, MONTHLY PRINCIPAL AND INTEREST ____%

      ii) MONTHLY UTILITIES, (including heat, electricity and telephone) ____%

   b) NON HOUSING EXPENDITURES: (including amount saved) ____%

   Total (a & b) 100%

5. What percent of your monthly non-housing expenditures (4b above) is spent in business establishments located in School District 68? ____%

6. If you pay fees, other than property taxes, to a local government agency for services such as water, sewage or garbage collection, state the average monthly amount. $ ____

APPENDIX B

STUDENT QUESTIONNAIRE

1. Were you registered in three or more courses in January, 1983?
   (a) Yes _____ (b) No _____

2. What kind of living accommodation do you have?
   (a) Rent _____ (c) Live at Home ____
   (b) Room and Board ___ (d) Other ____

3. How much do you pay per month for accommodation? (The amount should be your share) $_____

4. How much do you spend per month on goods and services excluding the amount paid for accommodation? $_____

5. Of the amount given in Question 4, what proportion (%) do you spend in business establishments in the Nanaimo area? _____ percent (%)

6. How many College students live in your household including yourself? _____

7. Do you have any children attending public school? If so, how many? _____

APPENDIX C

AVERAGE RESIDENTIAL MILL RATE

GEOGRAPHICAL AREA	(a) ASSESSED VALUE		(b) 1982 MILL RATE		(c) (a) x (b)
City of Nanaimo (Old)	22,930,800	x	136.277	=	3,124,940.60
City of Nanaimo (Extended)	85,684,585	x	130.777	=	11,205,572.00
Nanaimo Rural	44,461,527	x	85.000 (estimate)	=	3,779,229.70
Town of Ladysmith	9,568,505	x	98.272	=	940,213.12
	162,645.417				19,050,058.42

Average Mill Rate $\frac{\text{total (c)}}{\text{total (a)}} = 117.126$

Source: (a) B.C. Assessment Authority (as of December 1983)

(b) City of Nanaimo, 1983 Annual Budgets
Town of Ladysmith, Financial Statements, 1982
Province of British Columbia

APPENDIX D

AVERAGE INDUSTRIAL AND COMMERCIAL MILL RATE

GEOGRAPHICAL AREA	(a) ASSESSED VALUE		(b) 1982 MILL RATE		(c) (a) x (b)
City of Nanaimo (Old and Extended)	112,543,805	x	139.262	=	15,673,076.00
Nanaimo Rural	9,269,617	x	100,000* (estimate)	=	92,696.70
Town of Ladysmith	5,410,131	x	101.257	=	547,813.63
	127,223,553				16,313,586.33

Average Mill Rate $\frac{\text{total (c)}}{\text{total (a)}} = 128.228$

Source: (a) B.C. Assessment Authority (as of December, 1983)
(b) City of Nanaimo, 1983 Annual Budgets
City of Ladysmith, Financial Statements, 1982
Province of British Columbia, District Surveyor of Taxes, Property Tax Department

* Based on:

Rural land-general	12.0 mills
Non-residential school	56.0
Hospital, B.C. Assessment Authority	3.0
Library	2.5
Regional District	9.5
Fire Protection	9.8
Nanaimo Local Area	0.031
	92.831

APPENDIX E

LOCAL GOVERNMENTS' OPERATING COSTS FOR ALL MUNICIPAL SERVICES EXCEPT PUBLIC SCHOOLS

CITY OF NANAIMO

Operating Expenditures		$50,182,929
Minus:		
Conditional Transfers to Other Governments	2,468,237	
Transfer Levies for Other Governments	19,125,739	
Sub Total		$28,588,953

Source: City of Nanaimo, 1983 Annual Budget, pp. 6 and 23.

TOWN OF LADYSMITH

Total Expenditures		$ 2,798,648
Minus:		
Conditional Transfers to Other Governments	-	
Transmission of Taxes Levied for Other Governments	1,339,350	
Sub Total		$ 1,459,298

Source: Town of Ladysmith, 1982 Financial Statement.

Appendix E

REGIONAL DISTRICT OF NANAIMO

Total Expenditure		$19,386,183
Minus:		
Expenditures Obviously Not Within School District 68, Solid Waste Disposal, Electoral Areas E, F, G and H	$76,218	
Local Works and Services:		
Coombs-Hilliers	25,185	
Errington	32,383	
Nanoose	268,241	
French Creek	101,557	
Eagle Crest	323	
Arbutus Park Estates	144	
Breakwater	2,118	
Nankivell Point	113	
Columbia Beach	515	
Madrona Point	27,721	
West Bay Estates	27,369	
Sub Total		$18,824,296
Expenditures Allocated to School District 68		$15,891,796

$$18,824,296 \times \frac{\text{S.D. 68 population (65,090)}}{\text{R.D.N. population (77,101)}}$$

Source: Regional District of Nanaimo, Financial Statements, December 31, 1982, pp. 7 and 23. Statistics Canada, Catalogue Number 93-910, Tables 4 and 5. Central Statistics Bureau, Ministry of Industry and Small Business, Province of British Columbia.

TOTAL LOCAL GOVERNMENT EXPENDITURES	$45,940,047

APPENDIX F

CALCULATING THE INCOME MULTIPLIER

The income multiplier measures the subsequent impact of an initial income stimulus arising from the expenditures of students, College employees and the non-salary expenditures of the College. Its size is affected by a number of factors including the size and demographic characteristics of the local population, the savings and spending preferences of local individuals, the dependence on goods and services produced outside the local economy, the industrial and commercial structure of the local economy, the nature of the firm or institution whose impact is being measured etc.

The formula used to calculate the income multiplier is as follows:[15]

$$\frac{1}{1 - \text{propensity to spend locally} \times \frac{\text{local income generated}}{\$ \text{ of local expenditures}}}$$

With respect to assigning values to the variables in the formula, previous studies have indicated that, on average, $0.35 of every dollar spent in the local economy is returned to spenders as income while the balance is saved or spent on local and non-local materials, supplies, taxes etc.[16] According to the information obtained from the survey of full-time College personnel, $0.68 of every dollar of wage income received by local employees was spent in the local economy. The propensity to spend locally was generally higher for College students (Table 1). By weighting the percent spent locally

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[15] British Columbia, Department of Economic Development, BC/NKK Joint Steel Mill Feasibility Study - Preliminary Assessment, April 1976, Chapter 4, p. 10.

[16] Caffrey and Issacs, p. 44.

Appendix F

in Table 1 by the average monthly amount spent on non-housing items for each of the four groups of students surveyed, a weighted average student propensity to spend locally of .85 was calculated. As regards the non-salary expenditures of the College, the propensity to spend locally was estimated to be .44 (see page 3).

By calculating a propensity to spend for each of the three categories of College-related expenditures, it was possible to calculate three different income multipliers and thus increase the accuracy of estimating the indirect impact of the College-related expenditures. The three multipliers were estimated to be:

(1) Non-Salary College Expenditures: 1.18

(2) Expenditures by College Employees: 1.31

(3) Expenditures by College Students: 1.42

The order of magnitude of these income multipliers appear to be reasonable given the results of previous studies. In the Kitimat/Terrace and Prince George regions, multipliers of 1.25 and 1.40 respectively were used in determining the impact of the BC/NKK steel mill.[17] An inter-industry study of the Greater Vancouver economy used a multiplier of 1.68 for the entire education sector of the economy.[18] Finally, in the Alberta cities of Lethbridge and Calgary, multipliers of 1.54 and 1.90 respectively were used in measuring the impact of the Universities of Lethbridge and Calgary.[19]

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[17] British Columbia, Department of Economic Development, BC/NKK Joint Steel Mill Feasibility Study - Preliminary Assessment, April, 1976, Chapter 4, pp. 13 and 14.

[18] H. Craig Davis, An Inter-Industry Study of the Metropolitan Vancouver Economy, Faculty of Commerce and Business Administration, University of British Columbia.

[19] J. Allen, et al, Report on the Economic Impact of the University of Lethbridge on the City of Lethbridge, Economics Department, University of Lethbridge, March, 1976, and The Impact of the University of Calgary on the City of Calgary, Office of Institutional Research, Report No. 64, March, 1971.

APPENDIX G

THE EMPLOYMENT MULTIPLIER

The approach taken in estimating the employment multiplier relies on concepts used in economic base theory. This theory states that the growth and income level of any particular region depends upon its ability to export goods and services. The proportion of goods and services exported is allocated to the basic sector, while the proportion consumed within the economy is considered to be non-basic or service oriented. The service sector is viewed as being dependent primarily on the export sector for income and jobs. By assuming that there is a stable relationship between the employment levels in both sectors, economic base theory predicts that a change in the level of employment in the export sector leads to a change in the level of employment in the local service sector by some multiple of the growth in export jobs.

The economic base of a regional economy such as School District 68 consists, therefore, of those economic activities that result in the production of goods and services for sale outside of the region or else in-region to outsiders. It is on the basis of this latter criterion that Malaspina College is included in the basic or export sector of the local economy.

The extent to which the "output" of the College is assigned to the basic sector is dependent upon the proportion of local value-added contained in the goods and services purchased for use by the College as well as the proportion of the student population that immigrates for the purpose of acquiring a college education. The larger the magnitude of these proportions the greater the multiplicative effect of College-related expenditures on local employment.

In calculating the employment multiplier, local employment is allocated to either the basic (export) sector of the economy

Appendix G

or to the non-basic (local service) sector. As a result the entire labour force of the local economy is assigned to either the basic or non-basic sector. The employment multiplier is then calculated by dividing total local employment by total basic employment.

Two methods were used to assign the local employment to the two sectors. One method, known as location-quotient analysis, compares the proportion of the total local labour force employed in each industry to the proportions employed in the same industries in some bench-mark economy such as a regional economy of a similar structure, the provincial economy or the national economy. In this study the Canadian economy served as the bench-mark. Whenever the proportion of total local employment in an industry is equal to the proportion in the bench-mark economy, the local employment is considered to be just sufficient to meet the needs of the local economy and is classified as non-basic or local service. If the local proportion is greater than the bench-mark economy, the amount by which it exceeds the bench-mark economy is deemed to be part of the basic or export sector.

The other method of adjustment used in this study is based on the proportion of non-local funds used in providing government services to local people. In many cases the services received by local people are the result of provincial and federal funds and although a portion or all of these funds may be recycled local tax dollars, the assumption is that jobs supported by provincial or federal funds are basic or part of the export sector.

The use of these two methods in conjunction with some assumptions based on the author's knowledge of the local economy resulted in an employment multiplier of 2.12 (28,430 ÷ 13,385; Table 3).

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TABLE 3

THE CALCULATION OF BASIC EMPLOYMENT

INDUSTRY	EMPLOYMENT		
	LOCAL (%)	BENCH-MARK (%)[b]	BASIC
Primary	1875 (6.6)	1930 (6.8)	1875[c]
Manufacturing	3905 (13.7)	5458 (19.2)	3124[d]
Construction	2865 (10.1)	1771 (6.2)	1094[d]
Transportation, Communication and Other Utilities	2460 (8.6)	2294 (8.1)	166[d]
Trade	5730 (20.2)	4966 (17.5)	764[d]
Finance, Insurance and Real Estate	1395 (4.9)	1518 (5.3)	-
Community, Business and Personal Services	8060 (28.4)	8426 (29.6)	4997[e]
Public Administration and Defence	1820 (6.4)	1910 (6.7)	1365[f]
Totals	28,430[a]		13,385

Source: Statistics Canada, 1981 Census of Canada, British Columbia - Selected Social and Economic Characteristics, Catalogue No. 93-X-946, Table 1. Ottawa: Queen's Printer; also Statistics Canada. The Labour Force, Catalogue No. 71-001, December, 1981, Table 17. Ottawa: Queen's Printer.

[a] The industry figures do not equal the total local labour force figure due to the omission of the "Unspecified" category.

[b] Employment in each industry determined by the following formula:

$$\frac{\text{national employment in each industry}}{\text{total national employment}} \times \text{total local labour force}$$

[c] Employment in agriculture, forestry, fishing, trapping and mining are assumed to be all basic.

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[d]Estimated by Location-Quotient Analysis.

[e]Estimated by Source of Funds assuming average non-local source of funds to be approximately 62 percent. (see Robert L. Jeacock, The Impact of Malaspina College on the Local Economy, September, 1977.)

[f]On the basis of 1971 data, 75 percent of the total public administration employment was federal and provincial.

On the basis of work completed elsewhere there is reason to believe that the size of the employment multiplier is too large. Caffrey and Issacs suggest, after summarizing previously completed research, that an employment multiplier of 1.2 to 1.5 is appropriate for a college where the local economy has a population of approximately 50,000 people with four percent of the local labour force employed in manufacturing and 55 percent employed in services, trade, government and educational institutions.[20] The population of School District 68 is larger by about 12,000 people, has approximately 14 percent employed in manufacturing and 55 percent in trade, community, business and personal services and public administration. Given the slightly larger population and much larger proportion of people employed in manufacturing, the local employment multiplier should be at the top of the Caffrey-Issacs range. However, this is offset by the fact that Nanaimo is located close to Vancouver and Victoria, two major urban areas, and this contributes to the large leakage of cash flows from the local economy weakening the impact on employment.

Another reason for believing that the employment multiplier is too large is based on the fact that most of the students who attend Malaspina College live within the local economy. A recent survey of Academic/Career/Technical students indicates that about 83 percent of the students travel less than fifteen miles to attend College. This weakens the claim that the College is part of the basic (export) sector of the local economy and thus reduces the impact of student spending on local employment.[21]

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[20]Caffrey and Issacs, p. 44

[21]Malaspina College, Research and Planning. Five Year Plan Package - Environmental Scan, May, 1983

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This will be offset to the extent that there is reason to believe that the local student population would go elsewhere for their education if Malaspina College were not located in the local economy.

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